Remarks

Support for the amendment to Claim 13 may be found in the Applicants' specification on page 13 in paragraph [0038].

Claims 14 stands objected to over a typographical error. The Applicants have amended Claim 14 to correct the typographical error. Withdrawal of the objection is respectfully requested.

Claims 13 and 15 stand rejected under 35 USC §102 as being anticipated by JP 2002-146484 (JP '484). The Applicants note with appreciation the Examiner's detailed comments hypothetically applying JP '484 against Claims 13 and 15. The Applicants respectfully submit, however, that JP '484 fails to explicity or implicity disclose all of the subject matter set forth in those two claims. Detailed reasons are set forth below.

The Applicants note with appreciation the Examiner's frank admission that JP '484 does not specifically disclose the amount of precipitated W or the average thermal expansion coefficient between 20° and 800°C. The rejection relies on inherency with respect to those two non-disclosed and claimed features since the elemental components are within the ranges disclosed by JP '484. The rejection also invites the Applicants' attention to MPEP 2112 IV and V with respect to inherency.

The Applicants agree that JP '484 does not disclose the amount of precipitated W or the average thermal expansion coefficient between 20° and 800°C. The Applicants also respectfully submit that those omitted features are not inherent under the inherency requirements as set forth by the MPEP.

In determining inherency, the MPEP specifically states that:

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. MPEP 2112, IV, pg. 2100-47, right-hand column. (Emphasis added.)

Thus, the Applicants respectfully submit that inherency may not be established if the claimed result or characteristic may only be present. The test for establishing inherency is more stringent. This is also set forth at the same location in the MPEP as follows:

> To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established

> by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. (Emphasis added.)

In other words, an inherency rejection may only be established if the claimed result or characteristic is necessarily present, not that it may be present or could be present or might be present. That claimed result or characteristic must be present.

With the requirements for establishing inherency in mind, the Applicants invite the Examiner's attention generally to the methods in which the Applicants' claimed steels are made versus the methods disclosed by JP '484. Those skilled in the art are well aware of the fact that not only are the characteristics of steels potentially formed by the elemental components, but also the manner in which the steels are fabricated. This is important in this case inasmuch as the methods are different.

The Applicants specifically invite the Examiner's attention to pages 10-11 of the Applicants' Substitute Specification in paragraphs [0031] to [0034]. It can be seen that there are two important aspects of the methodology that affect the amount of precipitated W, for example. In particular, the hot-rolled sheet annealing temperature should be between about 950° and about 1150°C while the cold-rolled annealing temperature should be between about 1020° C and 1200°C. Controlling these two parameters, namely hot, cold, sheet annealing and finishing annealing has been discovered by the Applicants to affect the amount of precipitated W. Thus, the Applicants utilize methodology that maintains the hot-rolled sheet annealing temperature and the finish annealing temperature within the two specified ranges.

There is no such disclosure in JP '484 inasmuch as JP '484 has no appreciation for the effect of the hot-rolled sheet annealing temperature and the finish annealing temperature on the amount of precipitated W. The English "machine" translation of JP '484 contains little discussion with respect to the methodology. In any event, there is no discussion of the hot-rolled sheet annealing temperature and the finished annealing temperature. Thus, those skilled in the art do not know what those temperatures would be, even if those steps might be performed. In fact, there is some question as to whether these steps may even be performed inasmuch as there is no specific disclosure with respect to cold-rolling and there would therefore be no need for finish annealing in such an instance. In any event, there is no dual disclosure of controlling the hot-rolled sheet annealing temperature and the finish annealing temperature in JP '484.

What does this mean? This lack of disclosure means that the methodology between the Applicants' steels and the steels of JP '484 are quite different. The methodology affects the characteristics of the steels and the Applicants have discovered that controlling those two aspects within selected temperature ranges is particularly effective in controlling the precipitated W and average thermal expansion coefficient.

As a consequence, this also means that there is no evidence in JP '484 that the claimed amount of precipitated W and average thermal expansion coefficient would necessarily be the same. It is mere speculation that they could even possibly be the same. In fact, the disclosure in JP '484 is so inadequate in this respect, that one skilled in the art would have a reasonable expectation that the precipitated W and average thermal expansion coefficient would likely be different from what the Applicants claim. Thus, this means that JP '484 cannot sustain the requirements needed to establish inherency under MPEP 2112, IV and V.

Further, one of the objectives of JP '484 is to "provide high strength ferritic heat resistant steel having excellent creep rupture strength as the material for high temperature used for boiler tubes for heat generation, turbine parts, chemical plant apparatus, nuclear power plants or the like." In contrast, the Applicants provide "ferritic Cr-contained steel having a low thermal expansion coefficient" and "ferritic Cr-contained steel having a low thermal expansion coefficient suitable for applications in which a heat cycle is repeated between high temperature and low temperature, including exhaust system members of an automobile such as exhaust manifolds, exhaust pipes, converter case materials, and metal honeycomb materials; separators within a solid-oxide-type fuel cell; materials for interconnectors; material for reformers as peripheral members of fuel cells; exhaust ducts of power generation plants; or heat exchangers."

However, JP '484 does not include at least one element of Claim 13, namely the relationships between the amount of precipitated W and the thermal expansion coefficient.

The Applicants' specification on page 13, paragraph [0038] discloses "while obtaining precipitates W of 0.1% or less, in order to obtain an effect of low thermal expansion, hot-rolled-sheet annealing temperature: 950 to 1150°C, (preferably, 1020 to 1150°C), and finish annealing temperature 1020 to 1200°C, (preferably, 1050 to 1200°C)."

Nonetheless, JP '484 mentions on page 2 in the left column, Claims 1 and 2 (Claims 1 and 2 of the machine translation into English) and page 2, right column, paragraphs [0005] to [0006]

(paragraphs [0005] to [0006] of the machine translation into English), "this invention provides high strength ferritic heat resistant steel containing Fe group alloy wherein austenite generation elements, such as C and N, are reduced, ferrite generation elements, such as Cr, W, and Mo are included, in which 90% of matrix is always in a ferrite phase at a melting point or less, and in the matrix, a metallic compound of W, Mo and Fe is aging precipitated. The gist of the high strength ferrite group heat resistant steel is characterized in that, ... (1) ... (2) in the steel mentioned in (1) above, solid solution treatment before aging is conducted sufficiently and uniformly fine aging precipitation of the intermetallic compound is fostered." Further, JP '484 mentions on page 3, in the right column, paragraph [0011] (paragraph [0011] of the machine translation into English), "in the examples, solid solution heat treatment shown in Table 1 and aging treatment at 700°C for 1h" and additionally mentions, on page 4, paragraph [0014] (paragraph [0014] of the machine translation into English), "solid solution heat treatment at 900°C or more and aging temperature at about 600 to 750°C are effective."

As mentioned above, contrary to the Applicants' claims, JP '484 positively brings about aging precipitation of intermetallic compound consisting of W, Mo, Fe and so forth and further, solid solution heat treatment and aging treatment are indispensable. On the other hand, according to Claim 13, because the amount of precipitated W is controlled, the processes of solid solution heat treatment and aging treatment are not necessary to be performed.

From the foregoing, because Claims 13 and 23 of JP '484 are completely dissimilar in terms of the technical concepts, it is not reasonable to expect the amount of precipitated W in Claim 13 from JP '484. The Applicants respectfully submit that JP '484 cannot anticipate Claims 13 and 15 under §102. Withdrawal of the rejection is respectfully requested.

Claims 13-16, 20 and 21 stand rejected under 35 USC §102 as being anticipated by Miyazaki. This rejection is similar to the rejection with respect to JP '484 inasmuch as the rejection admits that Miyazaki does not disclose the amount of precipitated W and does not disclose the claimed average thermal expansion coefficient. This rejection also relies on inherency.

The Applicants respectfully submit that Miyazaki also does not provide disclosure that would lead one skilled in the art to believe that the claimed aspects would necessary be present. As noted above, not only do the elemental components of the steels impact the characteristics of the steels, but so does the methods in which the steels are made. This is where the differences become apparent

between the subject matter of Claims 13-16, 20 and 21 and Miyazaki. In that regard, Miyazaki provides limited discussion of the methodology of making the Miyazaki steels. The general discussion can be found in paragraph [0070] on page 5. Unlike JP '484, Miyazaki does disclose annealing the hot-rolled sheet and final annealing. However, the next paragraph, which is the only disclosure with respect to temperatures of hot-rolled sheet annealing and final annealing, namely paragraph [0071], discloses a hot-rolled sheet annealing temperature of 1,000° and a final annealing temperature of 1,000°. The finish annealing temperature is outside of the Applicants' finish annealing range. No other temperatures or temperature ranges are disclosed.

Thus, the Applicants respectfully submit that one skilled in the art would have a reasonable expectation that the precipitated W and average thermal expansion coefficient amounts for the steels of Miyazaki would likely be different from those as recited in Claims 13-16, 20 and 21. In any event, Miyazaki does not support an expectation that the characteristics would "necessarily" be present as is required to establish inherency under MPEP 2112, IV and V. The Applicants therefore respectfully submit that in the absence of the ability to establish inherency, Miyazaki cannot sustain the rejection under §102.

Miyazaki discloses "The present invention relates to a Cr-containing steel. In particular, the present invention relates to a soft Cr-containing steel which has both heat resistance and formability and is suitable for members used in high-temperature environments, for example and especially, exhaust pipes of automobiles and motorcycles, outer casings for catalysts, and exhaust ducts in thermal power plants." Also, Miyazaki depends on JP-A-2002-212685 which is disclosed in the Applicants' specification on page 2, in paragraph [0002], at line 6 from the bottom, and on which, a priority right under the Paris convention is claimed. Also, the Applicants and the inventors are the same with those in this application.

Nevertheless, Miyazaki contains a problem which the Applicants actually overcome and, concerning this, there is found a description, concerning the problematic point, which is provided in the Applicants' specification on page 2, in paragraph [0002], at lines 8 to 1 from the bottom, namely "in the related art, thermal fatigue life has been improved by a method using improvement in strength or high ductility by forming a high alloy. However, improved strength by forming the high alloy necessarily cause a problem of reduction in workability, and orientation of high ductility causes

strength to be extremely lowered, consequently, it is pointed that another problem (for example, fatigue at an elevated temperature) may occur.

In contrast, as set forth in the Applicants' specification on page 1, paragraph [0001], under the heading of Technical Field, recites "The invention relates to ferritic Cr-contained steel having a low thermal expansion coefficient. The disclosure also relates to ferritic Cr-contained steel having a low thermal expansion coefficient suitable for applications in which a heat cycle is repeated between high temperature and low temperature, including exhaust system members of an automobile such as exhaust manifolds, exhaust pipes, converter case materials, and metal honeycomb materials; separators within a solid-oxide-type fuel cell; materials for interconnectors; material for reformers as peripheral members of fuel cells; exhaust ducts of power generation plants; or heat exchangers."

However, Miyazaki does not include at all the element of amended Claim 13, namely the relationships between the amount of precipitated W and the thermal expansion coefficient.

The Applicants' specification on page 13, paragraph [0038], specifies "while obtaining precipitate W of 0.1% or less, in order to obtain an effect of low thermal expansion, hot-rolled-sheet annealing temperature: 950 to 1150°C, (preferably, 1020 to 1150°C), and finish annealing temperature 1020 to 1200°C, preferably, 1050 to 1200°C)."

In contrast, in Miyazaki, on page 5, in the left column, in paragraph [0070], there is set forth "The method for producing the steel according to the present invention is not specifically limited and any general method for producing Cr-containing steel can be suitably used... Sometimes, the step of annealing the hot-rolled steel may be omitted," and on page 5, in the left column, in paragraph [0071], there is set forth that an example was subjected to hot-rolled sheet annealing at 1,000°C and final annealing temperature at 1,000°C.

Further , Steels P, Q and R in Table 1 of the Applicants' specification correspond to Steel Nos. 22, 23 and 25 in Table 1 in Miyazaki and, because the final annealing temperature is 1,000°C, each of the amounts of precipitated W is as large as 1.660, 1.490 and 1.700, respectively, and all of the mean thermal expansion coefficients at a temperature of 20 to 80°C are in rank D (12.6×10^{-6}), being outside the range of Claim 13.

It is thus unreasonable to expect the amount of precipitated W of Claims 13 and 23. Moreover, according to Miyazaki, it is impossible to obtain an average thermal expansion coefficient

of a low thermal expansion coefficient between 20°C and 800°C being less than 12.6 X 10^{-6}. Withdrawal of the rejection is respectfully requested.

Claim 17 stands rejected under 35 USC §103 over Miyazaki. The Applicants respectfully submit that the fact that Miyazaki contains B and Mg in amounts that overlap Claim 17 does nothing to cure the deficiency set forth above with respect to Claims 13-16, 20 and 21. As a result, irrespective of the inclusion of the overlapping amounts of B and Mg, the Applicants respectfully submit that Miyazaki cannot sustain the rejection of Claim 17 under §103. Withdrawal of that rejection is also respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

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